Appl. No. 09/601,004
Amdt. dated October 27, 2003
Reply to Office action of April 25, 2003

REMARKS

Reconsideration is respectfully requested.   Claims 1-7 are
present in the application and are amended herein.

The Examiner raises several procedural issues.   The
Examiner states that a certified copy of the priority
application JP10-27770 is required.   However, this is a PCT
national phase entry application, and therefore applicants are
not required to provide a certified copy of the priority
document in the case of a PCT national phase entry application.
It is respectfully requested that a certified copy is not
required and that the request for such be withdrawn/

The Examiner also objects to the declaration, stating that
a notary's signature in English is required.   Applicants
respectfully submit that there is no requirement of a notary's
signature in English on a declaration.   The rule for notary's
signature would relate to notarized documents.   It is perfectly
acceptable practice for an inventor to sign the declaration
using non-English characters.

The Examiner also objects to the Abstract as being more
than 150 words in length.   Applicants amend the abstract herein
to meet this request.

The Examiner also makes some objections to the disclosure
and claims (in numbered paragraphs 5 and 6 of the office
action).   Applicants thank the Examiner for noting these items,

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and applicants have amended the claims and specification herein with attention to these points.

Claims 1-7 are rejected as being indefinite. The Examiner alleges the "values of a local support" is unclear. Applicants respectfully traverse.

The specification provides sufficient support for the meaning of this term.

The Examiner objects to the term "can be" as being indefinite. The portion of the procedure manual which the Examiner cites as supporting his objection (MPEP §2173.05(d)) is more concerned with the phrase "such as" and "for example" and makes no mention of the phrase "can be", and applicants believe the claims as filed were acceptable, but to further prosecution, applicants have amended the claims wording slightly to avoid use of the term "can be differentiated" by saying "is differentiable". This does not change the meaning, and it is hoped that this phase will be more acceptable to the Examiner.

With regard to claims 2, 3, 6 and 7, applicants make minor changes to the claims to attempt to be acceptable to the Examiner.

Claims 1-5 are rejected as being unpatentable subject matter. This rejection arises because the Examiner considers the claims to not have sufficient steps or structure to be other than a mathematical algorithm. The Examiner suggests that the inclusion of a limitation to a practical application (say, for

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example, limiting the claims to cover the interpolation of pixel

image data, or the inclusion of a computer to perform the

function). Applicants have added the computer to perform the

function, and therefore the rejection is respectfully requested

to be withdrawn.

Claims 1-7 are rejected as being anticipated by Masaru et

al. Applicants respectfully traverse this rejection.

Features of claim 1 of the present invention include

(1) the sampling function used for the interpolation of the

discrete data can be differentiated finite times,

(2) the sampling function has values of a local support.

It is possible to interpolate two discrete data with values

which smoothly connect two discrete data by using the sampling

function which can be differentiated finite times. An example

of sampling function which can't be differentiated finite times

is a case of that the angle of the edge of the sampling function

which has values of a local support is not horizontal. For

example, the sinc function shown in Fig. 7 (prior art) of the

present application uses a sampling function exists in the range

of $\pm\infty$. When this function is modified to the sampling function

which has values of a local support, first the range of

$+n \geq t \geq -n$ (for example, n=3) is extracted, then the other

ranges (the range of t > n or t < n) are set values to 0. In

this case, an inclination of the edge of the sampling function

near t, = $\pm$ n is predetermined angle except for 180° to the

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horizontal axis. When the interpolation is performed by using

such as this sampling function, interpolated values

corresponding to the left side and right side of +n (or -n) make

a polygonal line instead of a smooth curved line.

It is essential to have values of a local support far

reducing the amount of calculations when the interpolation is

performed. In the case where calculations are performed with

using sampling function exists in the range of $\pm\infty$, such as a

sinc function, although the amount of calculations are reduced

when the range of the calculations are limited to the finite

range ($+n \geq t \geq -n$) just like an above example, the truncation

errors arise due to omit the other ranges. Further, when the

finite range is used as the above case, the edge of the sampling

function forms a polygonal line, and therefore it is contrary to

the feature of the differentiability finite times.

Meanwhile, in the calculation of the interpolation value

with using a sampling function disclosed in the cited document

1, it is apparent from equation (1) that the term of the

quadratic B-spline functions Ψ_k multiplied by W_k (predetermined

coefficient) should be added (linear combination) from $k= -\infty$ to

$k=+\infty$. This is contrary to the feature that to have values of a

local support. To calculate actually the interpolation values

using the sampling function disclosed by the citation document

1, it is required to perform from this regard, even if the

citation document 2 is known, it would require calculation using

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a finite range of the sampling function (it is impossible to calculate the infinite range with computers), then it would come to be contrary to the feature that to have values of a local support.

The concrete shape of the sampling function of the present invention is shown in FIG. 3. As it will be clearly understood by FIG. 3, the edges of the sampling function are horizontal at ±2, and the values of the sampling function corresponding to the other ranges are all 0. Therefore, the sampling function of the present invention satisfies two essential features of the above (1) and (2) features.

A sampling function having an almost same shape as shown in FIG. 3 of the present invention is disclosed in the citation document 1. However, the sampling function in the citation document 1 exists in the range ±∞. In this regard, the sampling function in the citation document 1 has the same features as the sinc function (however, the sampling function in the citation document 1 converges to 0 faster).

Claims 1 and 2 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Ueda (U.S. 5,204,624). Applicant respectfully traverses. In the citation document 2, two dimensional interpolation with using sampling unit functions are disclosed. The sampling unit functions correspond to the sampling function in claim 1 of the present invention. Meanwhile, this sampling unit functions is expressed by

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(sin(nX))/(nx) as shown in the citation document 2, and this is

identical to the sinc function shown in the background of the

technical field (that is, the description of the prior art) in

the specification of the present application. Therefore, as

mentioned above, the sampling unit functions don't satisfy two

features of the above (1) and (2). The sampling unit functions

satisfy only a feature or other, that is, of the

differentiability finite times or to have values of a local

support. The cited document does not teach and it would not be

obvious to make the inventions of the claims 1 and 2 of the

present application.

Claims 3-7 are rejected under 35 U.S.C. §103(a) as

allegedly being unpatentable over Ueda (U.S. 5,204,624)in view

of Masaru et al. Applicant respectfully traverses.

The cited thesis (Masaru et al) does not disclose a

sampling function having two features of the above (1) and (2).

Therefore, even if the citation document 2 and the cited thesis

are known, it would not be able to make the inventions of the

claims 3 7 of the present application by combining these

citation documents.

New claim 8 is added herein, and is also submitted to be

allowable.

In light of the above noted amendments and remarks, this

application is believed in condition for allowance and notice

thereof is respectfully solicited. The Examiner is asked to

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contact applicant's attorney at 503-224-0115 if there are any
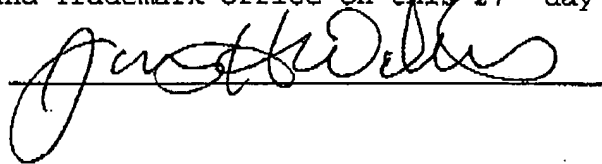
questions.

Respectfully submitted,

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